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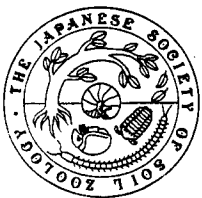
**The East Asian Species of the Ant Genus *Acropyga* Roger,
1862 (Hymenoptera: Formicidae: Formicinae)**

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Abstract The East Asian species of the ant genus *Acropyga* ROGER, 1862, are revised. Ten species are recognized of which three are new to science: one species belongs to the subgenus *Acropyga*, six species to *Rhizomyrma*, and three species to *Atopodon*. *Acropyga* (*Rhizomyrma*) *guangxiensis* sp. nov. is characterized by the mandible with four teeth, the distinctly incised metanotal dorsum, and the small eye consisting of single facet. *Acropyga* (*Rhizomyrma*) *septemstruma* sp. nov. is characterized by the antenna with seven articles, the absence of eyes, and the small body size (total length 1.3 mm). *Acropyga* (*Rhizomyrma*) *yunnanensis* sp. nov. most resembles *A. guangxiensis* sp. nov., but is separated from the latter by the very weakly incised metanotal dorsum and the eye consisting of four facets. *Acropyga acutiventris* ROGER is recorded from China for the first time. A key to the East Asian species is presented.

Key words: Hymenoptera, Formicidae, *Acropyga*, diagnostic characters

Introduction

The genus *Acropyga* ROGER, 1862, is represented by 58 extant species. According to BOLTON (1995), those are distributed in the Neotropical (27 spp.), the Indo-Australian (15 spp.), and the Oriental (8 spp.) Regions, and a few in the Ethiopian (3 spp.), the Palearctic (2 spp.), the Nearctic (1 sp.), and the Australasian (2 spp.) Regions. Six species have been known from East Asia: *A. nipponensis* TERAYAMA, 1985, *A. yaeyamensis* TERAYAMA and HASHIMOTO, 1996, and *A. kinomurai* TERAYAMA and HASHIMOTO, 1996, from Japan; *A. sauteri* FOREL, 1912, from Japan and China; *A. baodaoensis* TERAYAMA, 1985, from Taiwan island in China; *A. jiangxiensis* WANG and WU, 1992, from southern China.

Acropyga engages in trophobiotic associations with myrmecophile mealybugs (Homoptera) of the subfamily Rhizoechinae (SILVESTRI 1926, 1927; WILLIAMS 1978, 1998; TERAYAMA 1988). Honeydew provided by these insects is a major food source for the ants. The mealybugs live within the subterranean ant nests, where they are protected by the ants. They feed by sucking sap from the rootlets of plants accessible there (NIXON 1951; WAY 1963; BUSCHINGER *et al.* 1987; TERAYAMA 1988).

Recently, we have examined 125 specimens, including the types, of the *Acropyga* ants from various regions of East Asia. After careful examination, we recognized ten species and found that three of them are new to science and one is new to the East Asian fauna. In this paper, we revise the genus *Acropyga* of East Asia.

The following abbreviations for morphometric characters are used.

HL, head length: maximum full face view length from the anteriormost margin of clypeus to the occipital margin of head.

HW, head width: maximum full face view distance across head excluding eyes.

SL, scape length: length of scape excluding radicle.

CI, cephalic index: $HW \times 100/HL$.

SI, scape index: $SL \times 100/HW$.

WL, Weber's length of alitrunk: maximum diagonal distance from the base of anterior slope of pronotum to the propodeal lobe.

PL, petiolar scale length: maximum length of petiolar scale in lateral view.

PH, petiole height: maximum height of petiole in lateral view, measured perpendicularly from apex of petiolar node to venter of petiole.

TL, total body length: outstretched length from the mandibular apex to the gastral apex.

The following abbreviation of institutions are also used: ICKH, the Insect Collection, Kadoorie Farm and Botanic Garden, Hong Kong, China; ISYC, the Insect Collection, Faculty of Resources, Southwest Forestry College, Kunming, Yunnan Province, China; MNHA, Museum of Nature and Human Activities, Hyogo, Japan; NIAES, National Institute of Agro-Environmental Sciences, Tsukuba, Japan; RFBC, Research Institute of Forestry, Beijing, China.

Genus *Acropyga* ROGER

Acropyga ROGER, 1862: 242. [Type species: *Acropyga acutiventris* ROGER, 1862]

Diagnosis. Workers: small formicine ants. Total length of workers less than 4 mm. Antenna with seven to 11 articles. Eye small, its maximum diameter smaller than maximum width of antennal scape (with a few exceptions), or absent. Ocelli lacking in worker. Maxillary palpus 1–3 segmented and labial one 3–5. Alitrunk compact, and short in preferring to head and gaster; metanotal groove shallow; propodeum short. Propodeal spiracles large and oval. Petiole scale-like, thin and low. Gaster disproportionately large. Body color yellow to yellowish brown.

Remarks. The genus has been divided into four subgenera, *Acropyga* ROGER, 1862, *Atopodon* FOREL, 1912, *Rhizomyrma* FOREL, 1893, and *Malacomyrma* EMERY, 1922. *Acropyga* is characterized by the antenna with 11 articles and the mandible with five triangular teeth, and is distributed in the Oriental and the Australian Regions. *Atopodon* has also the antenna with 11 articles and the five-toothed mandible, but the basal tooth is truncate, and is distributed in the Oriental, the Australian, and the Palaearctic Regions. *Rhizomyrma* is characterized by the antenna with seven to 11 articles and three- or four-toothed mandible, and is mostly distributed in the Neotropical, the Oriental and the Australian Regions, and a few in the Palaearctic and the Nearctic Regions. *Malacomyrma* has the antenna with 11 articles in which the terminal article is remarkably long and five-toothed mandible, and is distributed in the Ethiopian Region. Three subgenera, *Acropyga*, *Rhizomyrma* and *Atopodon*, are known from East Asia.

Key to the East Asian Species of *Acropyga* (worker)

1. Eye large, consisting of more than 20 facets
.....A. (*Acropyga*) *acutiventris* ROGER
- Eye small, consisting of less than 5 facets.....2
2. Mandible with 3 or 4 teeth; basalmost tooth triangular,
with acute apex (Figs. 12, 18).....3
- Mandible with 5 teeth; basalmost tooth truncate
apically (Figs. 28, 31).....8
3. Antenna consisting of 7 articles; eye absent
.....A. (*Rhizomyrma*) *septemstruma* sp. nov.
- Antenna consisting of more than 9 articles; eye present
.....4
4. Mandible with 3 teeth (Fig. 12).....
.....A. (*Rhizomyrma*) *sauteri* FOREL
- Mandible with 4 teeth (Figs. 15, 18).....5
5. Head distinctly wider than long.....
.....A. (*Rhizomyrma*) *kinomurai* TERAYAMA
and HASHIMOTO
- Head longer than wide or as long as wide.....6
6. Antenna consisting of 10 articles; mesonotal dorsum
strongly convex in profile (Fig. 19).....
.....A. (*Rhizomyrma*) *yaeyamensis* TERAYAMA
and HASHIMOTO
- Antenna consisting of more than 10 articles; mesonotal
dorsum weakly convex in profile (Fig. 22).....7
7. Eye consisting of single facet; metanotum distinctly
incised dorsally (Fig. 6).....
.....A. (*Rhizomyrma*) *guanxiensis* sp. nov.
- Eye consisting of 4 facets; metanotum very weakly
incised dorsally (Fig. 22).....
.....A. (*Rhizomyrma*) *yunnanensis* sp. nov.
8. Propodeum in profile without distinct dorsal surface;
posterolateral margin convex, not forming angle
(Fig. 34).....
.....A. (*Atopodon*) *jiangxiensis* WANG and WU
- Propodeum in profile with distinct, near-horizontal
dorsal surface; posterolateral margin forming dull
angle (Fig. 33).....9
9. Head in full face view with parallel sides; petiolar scale
in profile thick, with obtusely angulate dorsal margin
.....A. (*Atopodon*) *nipponensis* TERAYAMA
- Head in full face view with slightly convex sides;
petiolar scale in profile thin, with acutely angulate
dorsal margin.....
.....A. (*Atopodon*) *baodaensis* TERAYAMA

Acropyga (Acropyga) acutiventris ROGER
(Figs. 1–3)

Acropyga acutiventris ROGER, 1862: 243.

Plagiolepis flava MAYR 1862: 699.

Acropyga flava: MAYR 1862: 769. [Synonymized by FOREL 1894: 418.]

Acropyga moluccana var. *australis* FOREL, 1902: 477.

Acropyga moluccana australis: FOREL 1911: 286. [Synonymized by TAYLOR 1992: 58.]

Diagnosis. Worker, HL 0.83–0.85 mm; HW 0.83–0.84 mm; SL 0.75–0.77 mm; CI 98–100; SI 90–92; WL 0.85–0.88 mm; PL 0.16–0.17 mm; PH 0.40–0.42 mm; TL 2.8–3.0 mm (5 workers measured).

Head in full face view square, with subparallel sides and weakly concave posterior margin. Mandible with 5 triangular teeth. Antenna with 11 articles; scape long, reaching posterior margin of head. Eye large, 0.12–0.14 mm in maximum diameter, larger than maximum width of antennal scape, and consisting of more than 20 facets. Promesonotum in profile with gently convex dorsal outline; propodeum in profile with flat dorsal surface and dully angulate posterodorsal corner. Petiole in profile thin and high, with reversed V-shaped form. Dorsum of head with abundant erect hairs; promesonotal dorsum with both short and long erect hairs, long hairs twice as long as shorter ones. Body yellowish brown.

Specimens examined. China (Hong Kong): 6 workers,

Ng Tung Chai, West Central New Territories, 12. xi. 1996, J. R. FELLOWES leg.; 1 worker, Green I., 30. viii. 1993, M. LAU leg.; 3 workers, Victoria Park, 7. xi. 1993, M. LAU leg.; 3 workers, Siu A Chau I., 13. viii. 1997, M. LAU leg.; 3 workers, Nam Fung Wood, 9. viii. 1996, M. LAU leg.; 3 workers, Green I., 22. iv. 1998, J. R. FELLOWES leg.

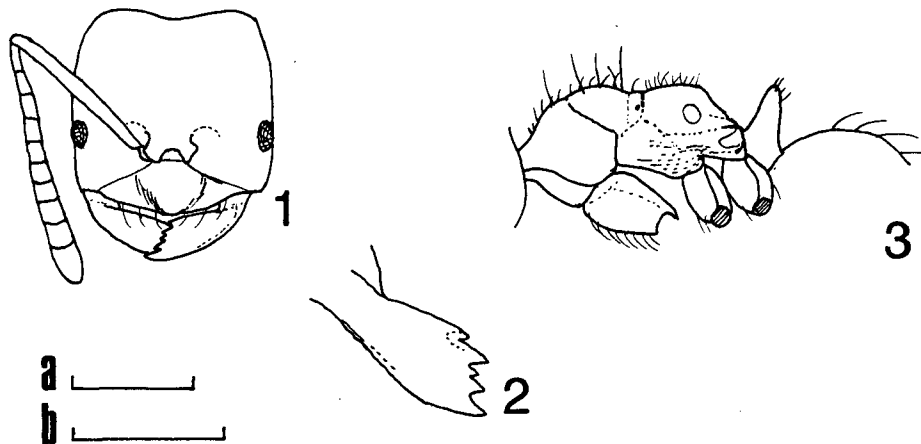
Distribution. India, Sri Lanka, Indonesia, Malaysia, Singapore, China (new record), Papua New Guinea, the Solomon Is., Australia.

Remarks. This species is separated from the other East Asian species by the shape of mandible with five triangular teeth, the large eye consisting of more than 20 facets, and the larger body. The workers were collected under stones and in the soil in secondary broadleaved forests from five to 300 m altitude in Hong Kong.

Acropyga (Rhizomyrma) guangxiensis sp. nov.
(Figs. 4–6)

Worker, HL 0.45 mm; HW 0.45 mm; SL 0.33 mm; CI 100; SI 72; WL 0.41 mm; PL 0.07 mm; PH 0.20 mm; TL 1.5 mm (holotype measured).

Head in full face view as long as wide, widest at anterior end, with almost straight posterior margin; posterolateral corner rounded; frons and vertex weakly shagreened and subopaque. Mandible with 4 small acute teeth; apical tooth followed by 2 teeth, diastema and basal tooth. Antenna at least with 10 articles (apex lacking in



Figs. 1–3. *Acropyga (Acropyga) acutiventris* ROGER, worker – 1, Head in full face view; 2, right mandible; 3, alitrunk and petiole in profile. Scale bars: a, 0.5 mm for 1, 3; b, 0.3 mm for 2.

holotype); scape not reaching posterior margin of head; pedicel longer than wide; 3rd to 10th articles each wider than long; 10th article 0.7 times as long as wide. Eye consisting of single facet.

Alitrunk short; pronotum largely smooth, with steeply raised anterior margin; mesonotal dorsum in profile very weakly convex; metanotal groove distinctly incised dorsally; dorsum of propodeum convex, posterodorsal margin in profile convex, not forming angle; lateral surface of propodeum smooth and shining; propodeal spiracle situated at middle of propodeum.

Petiole in profile thin and high; anterior margin with dull angle near midlength; posterior margin concave; in posterior view sides converging with concave dorsal margin.

Gaster weakly shagreened.

Dorsum of head with abundant short erect hairs; dorsum of alitrunk with abundant short decumbent hairs; gaster with suberect hairs.

Color yellow.

Holotype. Worker, Huaping, Guanxi, China, 19. viii. 1998, J. R. FELLOWES leg.

Type depository. ICKH.

Distribution. China (Guanxi).

Remarks. This species is distinguished from the other East Asian congeners by the four-toothed mandible, the small eye consisting of single facet, the distinctly incised metanotal dorsum, and the thin and high petiole. Known only from the holotype.

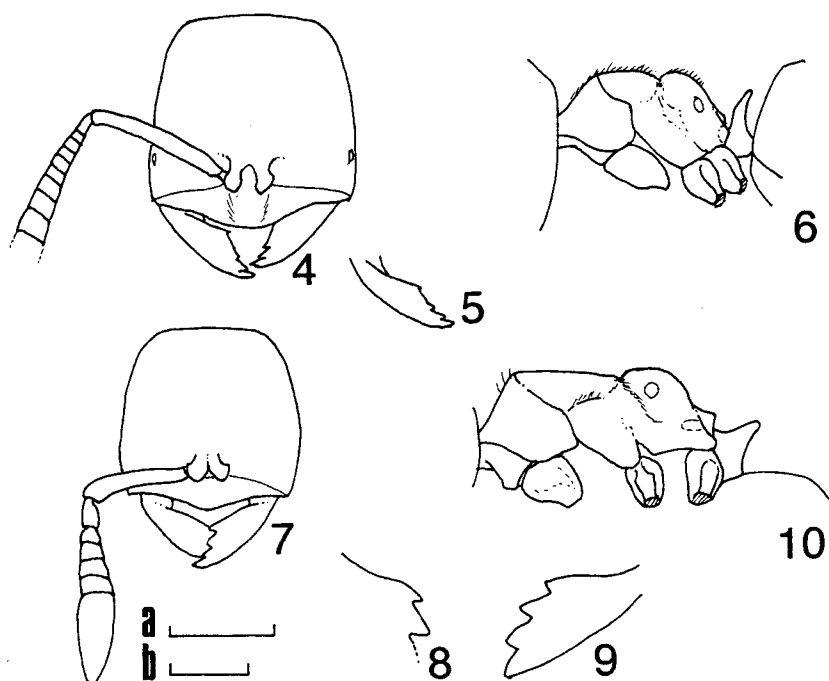
Etymology. The specific name refers to the type locality.

Acropyga (Rhizomyrma) septemstruma sp. nov.

(Figs. 7–10)

Worker, HL 0.36 mm; HW 0.35 mm; SL 0.23 mm; CI 97; SI 64; WL 0.43 mm; PL 0.10 mm; PH 0.13 mm; TL 1.3 mm (holotype measured).

Head in full face view as long as wide, with weakly convex sides and almost straight posterior margin;



Figs. 4–6. *Acropyga (Rhizomyrma) guanxiensis* sp. nov., worker – 4, Head in full face view; 5, right mandible; 6, alitrunk and petiole in profile. **Figs. 7–10.** *Acropyga (Rhizomyrma) septemstruma* sp. nov., worker – 7, Head in full face view; 8, basal and 2nd teeth of right mandible; 9, left mandible; 10, alitrunk and petiole in profile. Scale bars: a, 0.25 mm for 4–7 and 10; b, 0.13 mm for 8 and 9.

posterolateral corner rounded, not forming distinct angle; frons and vertex very weakly shagreened. Mandible with 4 triangular teeth (right mandible with basal tooth smaller than that of left mandible as in Fig. 8). Antenna with 7 articles; scape short, not reaching posterior margin of head; pedicel longer than wide; 3rd to 6th articles each distinctly wider than long; 5th article 0.6 times as long as wide; 6th article 0.5 times as long as wide; terminal article large, 2.3 times as long as wide, longer than preceding 4 articles combined. Eyes absent.

Alitrunk short; pronotum smooth, with steeply raised anterior margin; mesonotal dorsum in profile straight; posterodorsal corner of promesonotum in profile forming distinct angle; metanotal groove weakly incised dorsally; dorsum of propodeum nearly straight, posterodorsal corner in profile not forming angle; propodeal spiracle circular, situated at upper portion of propodeum.

Petiole slightly higher than long, acute triangular scale; in posterior view with concave dorsal margin and acutely angulate dorsolateral corners.

Gaster weakly shagreened.

Dorsum of head with abundant short erect hairs; dorsum of pronotum with several short hairs posteriorly; dorsa of mesonotum, metanotum and propodeum without hairs; petiole without dorsal hairs; gaster with suberect hairs.

Color pale yellow. Body cuticle thin.

Holotype. Worker, Sha Lo Tung, Northeast New Territories, Hong Kong, China, 27. vi. 1992, J. R. FELLOWES leg.

Type depository. ICKH.

Distribution. China (Hong Kong).

Remarks. This species is easily distinguished from the other congeners by the antenna with seven articles, the absence of eyes, and the small body size (TL ca. 1.3 mm). Known only from the holotype, which was found in a pitfall trap set in a 10 meter-high bamboo forest at altitude 180 m.

Etymology. Referring to the antenna with 7 articles.

Acropyga (Rhizomyrma) kinomurai TERAYAMA and HASHIMOTO

(Figs. 14–16)

Acropyga (Rhizomyrma) kinomurai TERAYAMA and HASHIMOTO, 1996: 7. [holotype and paratypes examined; MNHA]

Diagnosis. Worker, HL 0.45 mm; HW 0.53 mm; SL 0.40 mm; CI 118; SL 75; AW 0.53 mm; PL 0.05 mm; PH 0.15 mm; TL 1.8 mm (holotype measured).

Head in full face view wider than long. Mandible with 4 acute triangular teeth. Antenna with 11 articles; scape reaching posterior margin of head. Eye small, consisting of 5–6 indistinct facets. Dorsal outline of alitrunk almost straight. Petiole in profile with a reversed U-shaped dorsal margin. Dorsa of head and alitrunk with abundant short erect hairs. Body yellow.

Specimens examined. Worker [holotype], Yoshino, Ishigaki-jima, Yaeyama Is., Okinawa Pref., Japan, 16. viii. 1985, K. KINOMURA leg.; 13 workers [paratypes], Yoshino, Ishigaki-jima, Yaeyama Is., Okinawa Pref., Japan, 16. viii. 1985, K. KINOMURA leg.

Distribution. Japan (Ishigaki-jima I.).

Remarks. The symbiont mealybug is *Eumyrmococcus kinomurai* WILLIAMS and TERAYAMA, 2000 (WILLIAMS and TERAYAMA 2000). The nest was taken under a stone on the ground.

Acropyga (Rhizomyrma) sauteri FOREL
(Figs. 11–13)

Acropyga (Rhizomyrma) sauteri FOREL, 1912a: 72.

Diagnosis. Workers, HL 0.56–0.58 mm; HW 0.60–0.61 mm; SL 0.41–0.43 mm; CI 104–106; SI 69–74; AW 0.40–0.41 mm; PL 0.13–0.14 mm; PH 0.24–0.25 mm TL 2.0–2.5 mm (5 workers measured).

Head slightly wider than long. Mandible with 3 well-developed triangular teeth. Antenna with 11 articles; scape reaching posterior margin of head. Eye minute, consisting of single facet. Promesonotum in profile gently convex and propodeal dorsum convex. Head and alitrunk with numerous short erect dorsal hairs. Body yellow.

Specimens examined. Japan: 8 workers, Aogashima, Izu Is., Tokyo, 2. viii. 1988, M. TERAYAMA and S. KUBOTA leg.; 20 workers, Yuwan, Amami-oshima, Kagoshima Pref., 5. viii. 1982, H. TAKAMINE leg.; 7 queens, Tokunoshima, Kagoshima Pref., 20. iii. 1980, M. TERAYAMA leg.; 2 workers, Chibana, Okinawa-jima, Okinawa Pref., 19. v. 1983, T. MIZUKAMI leg.; 1 worker, Naha, Okinawa-jima, 27. vi. 1982, M. MORISITA leg.; 3 workers, Izena-jima, Okinawa Pref., 30. iii. 1985, H. TAKAMINE leg.; 5 workers, Iriomote-jima, Okinawa Pref., 13. viii. 1979, M. TERAYAMA leg. Taiwan I.: 6 workers,

Chipen, Taitung Hsien, 20. viii. 1982, M. TERAYAMA leg.

Distribution. Japan (southern parts of Honshu, Izu Is., Shikoku, Kyushu, Nansei Is.); China (Shanghai, Guangdong, Macao, Taiwan I.).

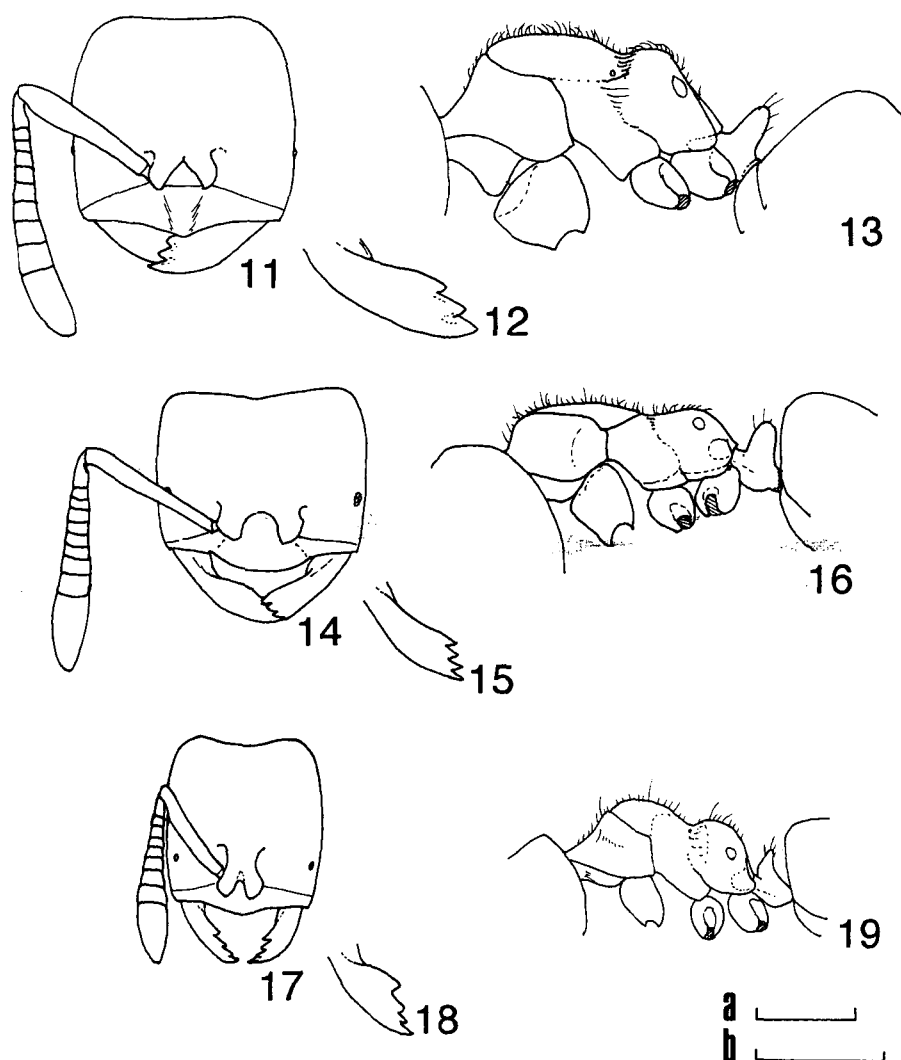
Remarks. This species is found in grasslands or woodland margins, and nests under stones or directly in the soil. Nuptial flights are observed from late March to June. Each alate female leaves the parent nest with a gravid mealybug in her mandibles (UYE 1928, 1933; TERANISHI 1929; TERAYAMA 1988). The symbiont mealybug is *Eumyrmococcus smithi* SILVESTRI, 1926. The

behavior of the young ant queen carrying mealybug from the mother nest has also been recorded for an *Acropyga* sp. in Szechuan, western China (BROWN 1945). The queens and males were described by WHEELER (1928) and SANTSCHI (1928), respectively.

Acropyga (Rhizomyrma) yaeyamensis TERAYAMA and HASHIMOTO

(Figs. 17–19)

Acropyga (Rhizomyrma) yaeyamensis TERAYAMA and



Figs. 11–13. *Acropyga (Rhizomyrma) sauteri* FOREL, worker – 11, Head in full face view; 12, right mandible; 13, alitrunk and petiole in profile. **Figs. 14–16.** *Acropyga (Rhizomyrma) kinomurai* TERAYAMA and HASHIMOTO, worker – 14, Head in full face view; 15, right mandible; 16, alitrunk and petiole in profile. **Figs. 17–19.** *Acropyga (Rhizomyrma) yaeyamensis* TERAYAMA and HASHIMOTO, worker – 17, Head in full face view; 18, right mandible; 19, alitrunk and petiole in profile. Scale bars: a, 0.25 mm in 11–13; b, 0.05 mm in 14–19.

HASHIMOTO, 1996: 5. [holotype and paratypes examined; MNHA]

Diagnosis. Worker, HL 0.40 mm; HW 0.38 mm; SL 0.28 mm; CI 95; SI 74; WL 0.40 mm; PL 0.05 mm; PH 0.13 mm; TL 1.7 mm (holotype measured).

Head in full face view almost square. Mandible with 4 large, triangular teeth. Antenna with 10 articles; scape short, not reaching posterior margin of head. Eye small, consisting of single facet. Dorsal outline of pronotum convex; propodeal dorsum convex. Petiole subtriangular in profile. Dorsa of head and alitrunk with a few short erect hairs. Body pale yellow.

Specimens examined. Worker [holotype], Urauchi, Iriomote-jima, Yaeyama Is., Okinawa Pref., Japan, 28. iii. 1991, M. TERAYAMA leg.; 3 workers [paratypes], Urauchi, Iriomote-jima, Yaeyama Is., Okinawa Pref., Japan, 28. iii. 1991, M. TERAYAMA leg.; 1 worker [paratype], Ishigaki-jima, Yaeyama Is., Okinawa Pref., Japan, M. MORISITA leg.

Distribution. Japan (Ishigaki-jima I., Iriomote-jima I.).

Remarks. This species has been known only from the Yaeyama Islands, southwestern Japan (Fig. 35). The ants are found from litter in broadleaved forest. The subgeneric name in the original description (page 5, left, line 40; *Rhizomyrma*) should be corrected to *Rhizomyrma*.

Acropyga (Rhizomyrma) yunnanensis sp. nov.

(Figs. 20–26)

Male, HL 0.35 mm; HW 0.36 mm; SL 0.23 mm; CI 103; SI 64; WL 0.65 mm; PL 0.06 mm; PH 0.18 mm; TL 1.8 mm (holotype measured).

Head in full face view as long as wide excluding eyes, with straight posterior margin. Mandible with 3 triangular teeth; apicalmost tooth longest. Anterior margin of clypeus convex. Eye 0.14 mm in maximum diameter. Antenna with 12 articles; scape almost reaching posterior margin of head; pedicel slightly longer than wide; funiculus short, 3rd to 11th articles each wider than long; terminal article longer than preceding 3 articles combined. Frons and vertex weakly shagreened.

Alitrunk 1.70 times as long as high in profile; anterior margin of pronotum convex and producing anteriorly; posterolateral margin of propodeum gently convex, not forming angle. Petiole thin, with a reversed V-shaped form; in posterior view scale with weakly concave dorsal

margin and angulate dorsolateral corners. Forewing 2.1 mm in length, longer than total body length, with 1st radial cell; medial cell not defined; vein M diverging basal to Rs.

Gaster largely smooth and shining. Paramere large and subtriangular in profile, with convex ventral and weakly concave dorsal margins; tip of paramere forming acute angle and slightly upturned. Aedeagus slender, with thin and dully angulate tip.

Dorsa of head and alitrunk with numerous short suberect hairs; gaster with suberect hairs.

Frons and gena brown; vertex dark brown; frontal lobe, clypeus, and mandible, yellow; antenna yellowish brown with darker terminal article; alitrunk yellow; legs yellowish brown; gaster yellow to yellowish brown.

Worker, HL 0.49 mm; HW 0.45 mm; SL 0.31 mm; CI 92; SI 69; WL 0.50 mm; TL not measured (petiole and gaster lacking) (one paratype measured).

Head in full face view slightly longer than wide, with straight posterior margin and parallel sides; posterolateral corner forming dull angle; frons and vertex weakly shagreened. Mandible with 4 acute triangular teeth. Antenna with 11 articles; scape not reaching posterior margin of head; pedicel longer than wide; 3rd to 10th articles each wider than long; 10th article 0.7 times as long as wide; terminal article twice as long as wide, longer than the preceding 3 articles combined. Eye consisting of 4 facets.

Alitrunk short; pronotum largely smooth and shining; mesonotal dorsum weakly convex; metanotal groove very weakly incised dorsally; dorsum of propodeum convex, posterodorsal corner in profile not forming angle; lateral surface of propodeum smooth and shining; propodeal spiracle situated at middle of propodeum.

Dorsum of head with numerous suberect short hairs; mandible with suberect hairs; dorsum of alitrunk with many suberect short hairs and several long erect hairs.

Ground color yellow; apical half of mandible, terminal segment of antenna, and tibiae brown.

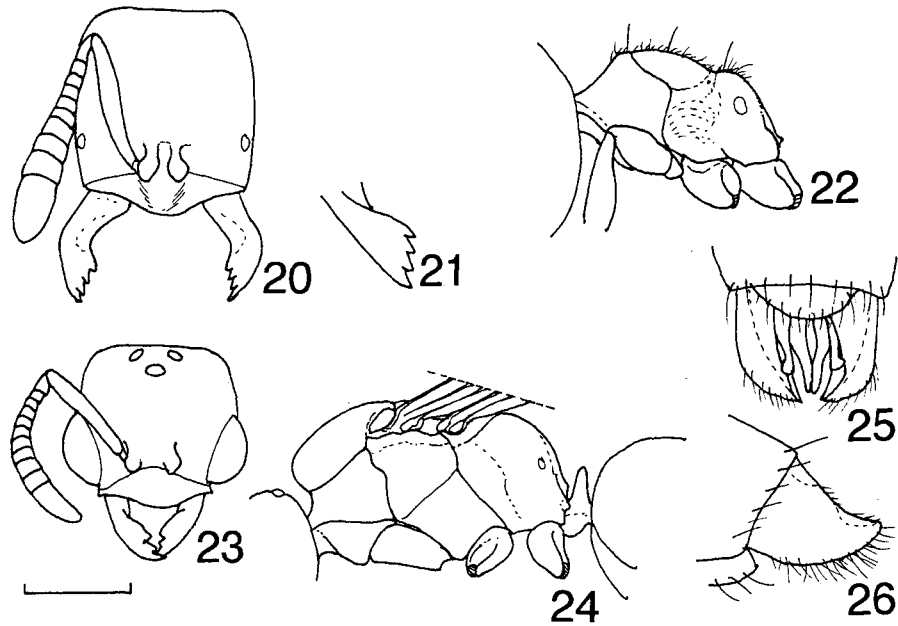
Holotype. Male, Nangong-shan, Xishuangbanna, Yunnan, China, 15. ix. 1997, Z. XU leg.

Paratypes. 1 male, 1 worker, from the same nest as the holotype.

Type depository. ISYC.

Distribution. China (Yunnan).

Remarks. This species resembles *A. guangxiensis* sp. nov. in having the antenna with 11 articles and the



Figs. 20–26. *Acropyga (Rhizomyrma) yunnanensis* sp. nov., worker and male – 20, Head in full face view, worker; 21, right mandible, worker; 22, alitrunk in profile, worker; 23, head in full face view, male; 24, alitrunk and petiole in profile, male; 25, genitalia in ventral view, male; 26, paramere in profile, male. Scale bar = 0.25 mm.

mandible with four teeth in worker. However it is easily distinguished from the latter by the very weakly incised metanotal dorsum (distinctly incised in *A. guangxiensis*) and the eye consisting of four facets (consisting of single facet in *A. guangxiensis*) in worker. This species also has long erect hairs on the dorsum of alitrunk (long erect hairs absent in *A. guangxiensis*) and the brown tibiae (legs uniformly yellow in *A. guangxiensis*). The specimens are from a natural evergreen broadleaved forest at 1380 m altitude in Yunnan Province, China (Fig. 35).

Etymology. The specific name refers to the locality.

Acropyga (Atopodon) baodaoensis TERAYAMA
(Figs. 27–29)

Acropyga (Atopodon) baodaoensis TERAYAMA, 1985: 284. [holotype and paratypes examined; NIAES]

Diagnosis. Worker, HL 0.65 mm; HW 0.60 mm; SL 0.45 mm; CI 92; SI 75; WL 0.65 mm; PL 0.13 mm; PH 0.26 mm; TL 2.2 mm (holotype measured).

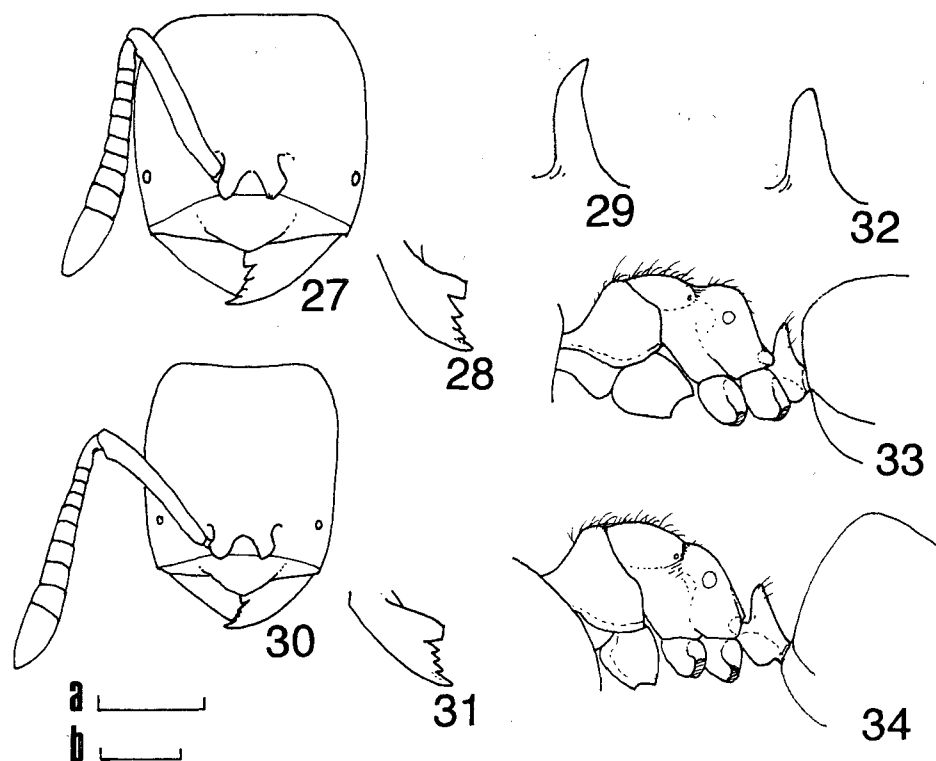
Head in full face view longer than wide, with straight posterior margin and slightly convex sides. Mandible with

5 teeth; apical 4 triangular; basal tooth larger, rectangular and apically truncate. Antenna with 11 articles; scape almost reaching posterior margin of head. Eye small, consisting of 1 or 2 facets. Promesonotum in profile convex; propodeal dorsum convex; posterior surface of propodeum steeply declivitous. Petiolar scale in profile thin and high, with acute dorsal margin; subpetiolar process longer than high, with convex ventral margin. Dorsa of head and alitrunk with a few short erect hairs. Body pale yellow.

Specimens examined. Worker [holotype], Nanshanchi, Nanfen Cun, Ren'ai Xiang, Nantou Hsien, Taiwan I., 12. viii. 1980, M. TERAYAMA leg.; 11 workers, 4 alate queens, 3 males [paratypes], Nanshanchi, Nanfen Cun, Ren'ai Xiang, Nantou Hsien, Taiwan I., 12. VIII. 1980, M. TERAYAMA leg.; 10 workers, 5 workers, Liukuei, Kaohsiung Hsien, Taiwan I., 17. viii. 1987, M. TERAYAMA leg.

Distribution. China (Taiwan I.).

Remarks. The nests are found in soil, under stones or rotten wood in broadleaved forests. A myrmecophilous mealybug, *Eumyrnococcus nipponensis* TERAYAMA, 1986, lives in the nests.



Figs. 27–29. *Acropyga (Atopodon) baodaensis* TERAYAMA, worker – 27, Head in full face view; 28, right mandible; 29, petiolar scale in profile. **Figs. 30–33.** *Acropyga (Atopodon) nipponensis* TERAYAMA, worker – 30, Head in full face view; 31, right mandible; 32, petiolar scale in profile; 33, alitrunk and petiole in profile. **Fig. 34.** *Acropyga (Atopodon) jiangxiensis* WANG and WU, worker, alitrunk and petiole in profile. Scale bars: a, 0.25 mm in 27, 28, 30, 31, 33, 34; b, 0.13 mm in 29 and 32.

Acropyga (Atopodon) jiangxiensis WANG and WU
(Fig. 34)

Acropyga (Atopodon) jiangxiensis WANG and WU, 1992:
226. [paratype examined; RFBC]

Diagnosis. Worker, HL 0.54 mm; HW 0.48 mm; SL 0.38 mm; CI 88; SI 79; WL 0.34 mm; PL 0.12 mm; PH 0.20 mm; TL 1.5 mm (one paratype measured).

Head in full face view longer than wide, with straight to slightly concave posterior margin and parallel sides. Mandible with 5 teeth, apical 4 triangular; basal tooth larger, rectangular and apically truncate. Eye small, consisting of 1 or 2 facets. Antenna with 11 articles; scape not reaching posterior margin of head. Promesonotum convex in profile; posterodorsal portion of propodeum very weakly convex; posterior margin of propodeum

almost straight, and gently declivitous. Petiolar scale in profile with acute triangular outline, with dully angulate dorsal margin; subpetiolar process mostly produced ventrally at posterior portion. Dorsa of head and alitrunk with a few short erect hairs. Body pale yellow.

Specimens examined. China [paratype]: 1 worker, Dali Shan, Fenyi, Jiangxi, 11. ix. 1989, J. WANG leg.; 1 worker, Jianfengling, Hainan I., 9. iv. 1998, J. R. FELLOWES leg.; 3 workers, Dayaoshan, Guangxi, 18. ix. 1998, J. R. FELLOWES leg.

Distribution. China (Jiangxi, Guangxi, Hainan I.).

Remarks. This species is distinguished from other East Asian species of subgenus *Atopodon*, *A. baodaensis* TERAYAMA from Taiwan, and *A. nipponensis* TERAYAMA from Japan by the weakly convex posterodorsal margin and almost straight posterior margin of the propodeum.

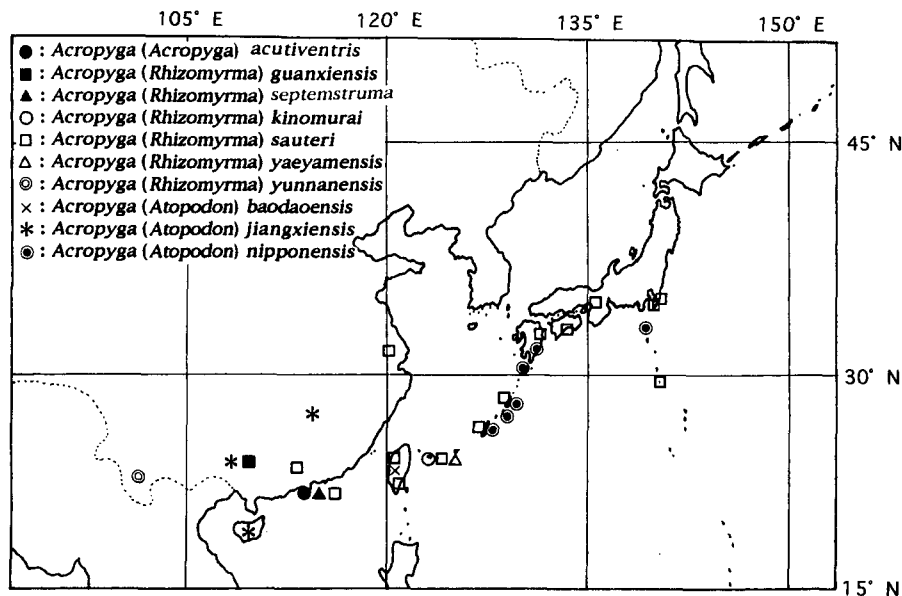


Fig. 35. Distribution map of species of *Acropyga* in East Asia.

Acropyga (Atopodon) nipponensis TERAYAMA

(Figs. 30–33)

Acropyga (Atopodon) nipponensis TERAYAMA, 1985: 287. [holotype and paratypes examined; NIAES]

Diagnosis. Worker, HL 0.60 mm; HW 0.48 mm; SL 0.39 mm; CI 80; SI 81; WL 0.53 mm; PL 0.14 mm; PH 0.25 mm; TL 1.9 mm (holotype measured).

Head in full face view longer than wide, with straight posterior margin and parallel sides. Mandible with 5 teeth, apical 4 triangular; basal tooth larger, rectangular and apically truncate. Eye small, consisting of 1 or 2 facets. Antenna with 11 articles; scape not reaching posterior margin of head. Promesonotum convex in profile; propodeal dorsum convex; posterior margin of propodeum convex and steeply declivitous. Petiolar scale in profile with obtusely angulate dorsal margin; subpetiolar process longer than high, with convex ventral margin. Dorsa of head and alitrunk with a few short erect hairs. Body pale yellow; gaster lighter than head and alitrunk.

Specimens examined. Japan: Worker [holotype], Noboritachi, Mikura-jima, Izu Is., Tokyo, 30. iii. 1980, K. MASUKO leg.; 9 workers [paratypes], Noboritachi, Mikura-jima, Izu Is., Japan, 30. iii. 1980, K. MASUKO

leg.; 5 workers, Amami-oshima, Kagoshima Pref., 3. vii. 1983, M. TERAYAMA leg.; 1 worker, Yoron-jima, Kagoshima Pref., 15. iii. 1980, M. TERAYAMA leg.; 1 worker, Motobu-machi, Okinawa-jima, Okinawa Pref., 10. i. 1983, K. KINOMURA leg.

Distribution. Japan (Mikura-jima I., Shikoku, Kyushu, Yaku-shima I., Nansei Is.).

Remarks. The nests are found in soil under stones or rotten wood in broadleaved forests in Japan (Fig. 35). A myrmecophilous mealybug, *Eumyrmococcus nipponensis* TERAYAMA, 1986, lives in the nests, and the ants feed on its honeydew (TERAYAMA 1985, 1986.).

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摘 要

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Acropyga 属 (ミツバアリ属) の東アジア産の種を分類学的に総括した。本地域から3新種を含む10種を認めた。亜属単位で見ると、*Acropyga* 亜属のものが1種、*Rhizomyrma* 亜属のものが6種、*Atopodon* 亜属のものが3種であった。

新種として記載した *Acropyga (Rhizomyrma) guangxiensis* sp. nov. は大あごに4歯を持ち、触角は11節からなり、後胸溝は明瞭に刻まれることと、1個の個眼のみからなる小さな眼を持つことで特徴づけられる。*Acropyga (Rhizomyrma) septemstruma* sp. nov. は、7節がらなる触角、眼を欠くこと、小形のサイズ(体長1.3 mm)によって容易に他種と区別される。*Acropyga (Rhizomyrma) yunnanensis* sp. nov. は *A. (R.) guanxiensis* sp. nov. に最も類似するが、後胸溝は弱く刻まれ、眼は4個の個眼からなることによつて *guanxiensis* と区別される。

Acropyga (Acropyga) acutiventris ROGER を今回中国(香港)から初めて記録し、東アジア産種の検索表をあわせて提供した。

References

- BOLTON, B., 1995. A new general catalogue of the ants of the world. Harvard University Press, Massachusetts, 504 pp.
- BROWN, W. L., Jr., 1945. An unusual behavior pattern observed in a Szechanese ant. *Journal of the West China Border Research Society (B)*, **15**: 185-186.
- BUSCHINGER, A., HEINZE, J., JESSEN, K., DOUWES, P. and WINTER, U., 1987. First European record of a queen ant carrying a mealybug during her mating flight. *Naturwissenschaften*, **74**: 139-140.
- EMERY, C., 1922. Quelques fourmis nouvelles minuscules. *Annales Historico-Naturales Musei Nationalis Hungarici*, **19**: 107-112.
- FOREL, A., 1893. Formicides de l'Antille St. Vincent. Récoltées par Mons. H. H. Smith. *Transactions of the Entomological Society of London*, **1893**: 333-418.
- FOREL, A., 1894. Les formicides de l'Empire des Indes et de Ceylan. Part 4. Adjonction aux genres *Camponotus* MAYR et *Polyrhachis* Shuck. *Journal of the Bombay Natural History Society*, **8**: 396-420.
- FOREL, A., 1902. Fourmis nouvelles d'Australie. *Revue Suisse de Zoologie*, **10**: 405-548.
- FOREL, A., 1911. Die Ameisen des K. Zoologischen Museums in München. *Sitzungsberichte der Königlich Bayerischen Akademie der Wissenschaften Mathematisch-Physikalische Klasse*, **1911**: 249-303.
- FOREL, A., 1912a. Descriptions provisoires de genres, sous-genres et espèces de formicides des Indes orientales. *Revue Suisse de Zoologie*, **20**: 761-774.
- FOREL, A., 1912b. H. SAUTER's Formosa-Ausbeute. Formicidae (Hym.). *Entomologische Mitteilungen*, **1**: 67-81.
- MAYR, G., 1862. Myrmecologische Studien. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien*, **12**: 649-776.
- NIXON, G. E. J., 1951. The association of ants with aphids and coccid. Commonwealth Institute of Entomology, London, 36 pp.
- ROGER, J., 1862. Einige neue exotische Ameisen-Gattungen und Arten. *Berliner Entomologische Zeitschrift*, **6**: 233-254.
- SANTSCHI, F., 1928. Nouvelles fourmis de Chine et du Turkestan Russe. *Bulletin et Annales de la Société Entomologique de Belgique*, **68**: 31-46.
- SILVESTRI, F., 1926 (1925). Descrizione di un novo genere di Coccidae (Hemiptera) mirmecofilo della Cina. *Bollettino del Laboratorio di Zoologia Generale e agraria della Reale Scuola Superiore d'Agricoltura in Portici*, **18**: 271-275.
- SILVESTRI, F., 1927. Descriptions of two species of myrmecophilous Coccidae (Hemiptera, Insecta). *China Journal*, **7**: 253-254.
- TAYLOR, R. W., 1992. Nomenclature and distribution of some Australian and New Guinean ants of the subfamily Formicinae. *Journal of the Australian Entomological Society*, **31**: 57-69.
- TERANISHI, C., 1929. Japanese ants, their behavior and distribution (1). *Zoological Magazine*, **41**: 239-251. [In Japanese]
- TERAYAMA, M., 1985. Two new species of the ant genus *Acropyga* (Hymenoptera, Formicidae) from Taiwan and Japan. *Kontyû*, **53**: 284-289.
- TERAYAMA, M., 1986. A new species of the anomalous ant-attended mealybug genus *Eumyrmococcus* (Homoptera, Pseudococcidae) from Japan. *Kontyû*, **54**: 509-512.
- TERAYAMA, M., 1988. Some taxonomical and biological notes on the myrmecophilous mealybug genus *Eumyrmococcus* (Homoptera: Pseudococcidae). *Rostria*, **39**: 643-648. [In Japanese with English Summary]
- TERAYAMA, M. and HASHIMOTO, Y., 1996. Taxonomic studies of the Japanese Formicidae, part 1. Introduction to this series and descriptions of four new species of the genera *Hypoponera*, *Formica* and *Acropyga*. *Nature and Human Activities*, **1**: 1-8.
- UYE, T., 1928. "Arinotakara": a coccid, the treasure of the ant. *Insect World*, **32**: 77-79. [In Japanese]
- UYE, T., 1933. A livestock ant. *Entomological World*, **1**: 602-608. [In Japanese]

- WANG, C. and WU, J., 1992. A new species of the ant genus *Acropyga* ROGER of China. *Scientia Silvae Sinicae*, **28**: 226–229.
- WAY, M. J., 1963. Mutualism between ants and honeydew-producing Homoptera. *Annual Review of Entomology*, **8**: 307–343.
- WHEELER, W. M., 1928. Ants collected by Professor F. SILVESTRI in China. *Bollettino del Laboratorio di Zoologia generale e agraria della R. Istituto Superiore agrario in Portici*, **22**: 3–38.
- WILLIAMS, D. J., 1978. The anomalous ant-attended mealybugs (Homoptera: Pseudococcidae) of South-East Asia. *Bulletin of the British Museum (Natural History) (Entomology)*, **37**: 1–72.
- WILLIAMS, D. J., 1998. Mealybugs of the genera *Eumyrmococcus* SILVESTRI and *Xenococcus* SILVESTRI associated with the ant genus *Acropyga* ROGER and a review of the subfamily Rhizoecinae (Hemiptera, Coccoidea, Pseudococcidae). *Bulletin of the Natural History Museum (Entomology)*, **67**: 1–64.
- WILLIAMS, D. J. and TERAYAMA, M., 2000. A new species of the mealybug genus *Eumyrmococcus* SILVESTRI (Hemiptera: Pseudococcidae, Rhizoecinae) associated with the ant *Acropyga* (*Rhizomyrma*) *kinomurai* TERAYAMA et HASHIMOTO (Hymenoptera: Formicidae) in the Ryukyu Islands, Japan. *Entomological Science*, **3**: 373–376.